Understanding the impact of the Hajj: explaining experiences of self-change at a religious mass gathering

Article (Accepted Version)

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Running title: Experiences of self-change at the Hajj

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No conflict of interest to declare.

Word count (excluding references): 9,668

ACKNOWLEDGMENTS. We would like to thank Dr Mohammed Edrees, Dr Adnan Gutub, Dr Basim Zafar, Kristoffer Post, Michael Chant, Keita Qasom, Mohammed Diyar, Gaddafi Dorma, Ahmed Zain Al Ghazal, Abdalufa Musliman, Abraham Elias, Sherif Aziz Allah, Obaidullah Al-Nasser, Fateh Tenker, Sohail Oglu, Kalim Khan, Wessam Hassanin, and Mazen

Menshawe for assistance with the planning, data collection, and data entry for this study; and the Custodian of the Two Holy Mosques Institute of Hajj Research and The Centre of Research Excellence in Hajj and Omrah for logistical support throughout the project.

This research was funded by a doctoral scholarship grant from the Ministry of the Interior, Kingdom of Saudi Arabia, to the first author.

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Abstract

Previous research has shown that participation in the Hajj pilgrimage to Mecca can lead to both more positive outgroup attitudes and increased commitment to Muslim identity. We describe a survey of pilgrims (N = 1176) carried out at Mecca, during the Hajj, which tested explanations for these experiences of self-change at the time of their occurrence. In line with contact theory, perceived cooperation among pilgrims indirectly predicted more positive outgroup attitudes (as well as enhanced Muslim identification), via identification with the crowd. In line with social identity and identity congruence explanations, positive emotional experience and the perception that the crowd embodied the Muslim value of unity predicted self-change variables through identification with the crowd. The finding that participation in an all-Muslim gathering increases positive views of other groups (including non-Muslims) through identification with the crowd offers an alternative perspective to suggestions that such gatherings might encourage intolerance.

Key words: Hajj, crowd, social identity, contact, Muslim, identity enactment

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Towards the end of his autobiography, Malcolm X (1965) described in compelling terms the revelation he experienced on attending the Hajj, or pilgrimage, to Mecca:[1]

> My pilgrimage broadened my scope. It blessed me with new insight. In two weeks in the Holy Land, I saw what I had never seen in thirty-nine years here in America. I saw all *races*, all *colors*, – blue-eyed blonds to black-skinned Africans – in *true* brotherhood! In unity! … It was in the Holy World that my attitude was changed, by what I experienced there, and by what I witnessed there, in terms of brotherhood – not just brotherhood toward me, but brotherhood between all men, of all nationalities and complexions, who were there. (pp. 478-479, emphasis in original)

Following this experience of profound self-change during the Hajj, Malcolm X's politics shifted from Black separatism in favour of a more ethnically-inclusive approach. Thus, his experience of self-change "in the moment" at the Hajj translated subsequently into a lasting transformation in his attitudes and behaviour towards other groups.

Malcolm X's case is by no means unique. Comparing a matched sample of people who had and had not attended the Hajj, Clingingsmith, Khwaja and Kremer (2009) found evidence for a range of downstream psychological effects of the pilgrimage. These included not only greater commitment to universal Muslim values, but also greater belief in harmony with different ethnic groups and Islamic sects, and more progressive attitudes to the social position of women. Given recent suggestions expressed in some quarters that Islam encourages intolerance towards other groups, these effects of the Hajj are striking and important. Yet the underlying mechanisms are

unclear. Notably, Clingingsmith et al. measured these effects at a distance of five to eight months after respondents had attended the Hajj, and they took no measures of social psychological process. Given the difficulties of accessing participants during the Hajj itself, they could not examine the experiences of self-change "in the moment" that lie at the heart of Malcolm X's autobiographical account.

In the present study, we exploited a unique opportunity to survey pilgrims as they actually took part in the Hajj, allowing us to investigate contemporaneously some of the group processes and other factors underlying experiences of psychological change. We sought to examine two types of experienced self-change among Hajj pilgrims: enhanced Muslim identification and more positive attitudes to people from different religions and cultures. We examined three types of predictors of these experiences of change: positive contact in the form of perceived cooperation from other pilgrims; positive and negative emotional experiences; and embodiment of Muslim spiritual values in the crowd. As suggested by Malcolm X's autobiographical account, and drawing on crowd psychology theory (Neville & Reicher, 2011), we hypothesized that identification with the ethnically-diverse crowd would be a key mediator of the effects of these predictors on experiences of self-change. This and other predictions are presented in Figure 1.

----------Insert Figure 1 about here----------

We suggest that studying the effects of the Hajj on Muslim identification and intergroup attitudes can tell us more than about one particular religious mass gathering. Specifically, in examining the possible role of identity processes in this event, we argue that this investigation can tell us about crowds in general and their potential to remake social identities (Reicher & Drury, 2011).

The Hajj and the Values it Promotes

Taking part in the annual Hajj is expected of all able-bodied and financially capable Muslims at least once in their lifetime. The event is one of the world's largest mass gatherings, with up to three million people officially participating at a time. The Hajj has been called Islam's "global gathering" (e.g., Clingingsmith et al., 2009), because pilgrims of different nationalities, social classes, cultures, and Muslim sects come from all over the world to take part together in a series of rituals. While the purpose of Hajj is individual salvation and clearing of sins (Maqsood, 2008), it is essentially a *crowd* experience since the activities are undertaken collectively over a specific five-day period each year. Cooperation is required in rituals such as *tawaf*, in which thousands of people simultaneously circumambulate the *Ka'aba* (the black cuboid building at the center of the Grand Mosque, Mecca) seven times, moving at the same pace. The Hajj is said to embody and to promote unity among pilgrims (e.g., Memish, Stephens, Steffen, & Ahmed, 2012); the harmony, commonality and equality of the mass of pilgrims is emphasized by the fact that all men wear the same simple white cloth, known as the *ihram*.

The promotion of unity among Muslims at the Hajj has sometimes been seen as a source of threat to non-Muslims. In the 19th century, the British authorities viewed Muslim colonial subjects attending the Hajj as a danger through the connections they could make with other Muslims across the world, connections which could threaten the order of the state and the empire (Low, 2007). The Victorian explorer Richard Burton argued that the Hajj "sends forth a horde of malcontents that ripen into bigots; it teaches foreign nations to despise our rule" (1855-1856, pp. 185-186; cited in Slight, 2016, p. 105). More recently, the notion that Islam is inherently intolerant, and therefore violent, to non-Muslims was common following the Charlie Hebdo killings in France in January 2015 (e.g., Ali, 2015). As Lynch (2015) argues, the portrayal of

terrorist attacks such as 9/11 as “Muslim issues” has led to the depiction by some of a “global Muslim community” defined in terms of conflict with non-Muslims (see also Ahmed & Matthes, 2017).

Psychological Effects of Attending the Hajj

In the first study to examine whether the Hajj has any psychological effects on pilgrims, Clingingsmith et al. (2009) carried out a natural experiment by taking advantage of the lottery arrangement employed in Pakistan to allocate the limited number of places on the Hajj. Some months after the 2006 Hajj, they surveyed 1,600 people who had entered the lottery, around 66% of whom were successful (and so had attended the Hajj) while the rest were not (and so had stayed home). Given the random nature of selection, it was reasonable to assume that there were no systematic prior differences in the two groups and therefore that any differences found were effects of attending the Hajj. Among the key findings were that pilgrims who had attended the Hajj displayed more positive views towards other nationalities (average effect size [AES] = 0.150), developed a greater belief in harmony among people of different religions and different Muslim sects (AES = 0.128), were more peacefully inclined (AES = 0.111), developed more progressive views towards female education (AES = 0.092), and became more committed to universal Muslim practices (AES = 0.163), but less committed to local customs (AES = −0.101). The authors concluded:

> Our results support the idea that the Hajj helps to integrate the Muslim world, leading to […] a sense of unity and equality with others who are ordinarily separated in everyday life by sect, ethnicity, nationality or gender, but who are brought together during the Hajj. Although the Hajj may help forge a common Islamic identity, there is no evidence that this

is defined in opposition to non-Muslims. On the contrary, the notions of equality and harmony appear to extend to adherents of other religions as well. (p. 1135)

More recently, a focus group interview study of Russian Muslims compared pilgrims to non-pilgrims (Alexseev & Zhemukhov, 2015). Similarly to Clingingsmith et al. (2009), it concluded that attending Hajj strengthened pride in being a Muslim and increased outgroup-tolerance and prosocial motives. Thus, previous studies point to two forms of experienced self-change as a result of participating in the Hajj: *enhanced Muslim identification* and *increased positive attitudes to outgroups*.

What are the reasons for these psychological changes? A limitation of both previous studies is that they did not investigate *process* within their designs. The aim of the present study was therefore to examine psychological predictors and mechanisms underlying two types of self-changes experienced by pilgrims while attending the Hajj. A second limitation of these two previous studies of self-change at the Hajj is that each sampled one nationality only. As Clingingsmith et al. (2009) admit, it is possible that pilgrims attending Hajj from other countries might become less tolerant (or might not change at all), since Islam includes several different sects and local variants, some of which are more conservative than others. Therefore, we aimed to carry out this investigation on a sample more representative of the diversity of cultural and national backgrounds among pilgrims at the Hajj. Before describing our study in detail, we examine possible processes underlying experiences of change among Hajj pilgrims.

Explaining Effects of the Hajj on Positive Attitudes to Outgroups

We first examine a possible process behind *increased positive attitudes to outgroups.* Clingingsmith et al. (2009) speculated that "interaction" may have been responsible for the changes they documented in their study. They point out that the communal rituals of the Hajj

bring pilgrims into contact with different cultural groups and their norms. They found that most Hajjis in their study reported interacting with people from other countries. However, Clingingsmith et al. did not examine whether such interaction predicted the changes in attitudes they found.

The idea that positive contact between different groups can promote harmony between them is one of the most well-researched in the history of social psychology (see Pettigrew & Tropp, 2006; Paluck, Green, & Green, 2017). Cooperation in pursuit of common goals is one important feature of such positive contact (Allport, 1954), leading us to expect that *perceived cooperation* among members of the ethnically-diverse Hajj crowd would be a predictor of increased positive attitudes to outgroups (see Figure 1).

In the present case, we were interested in measuring changed attitudes towards not only Muslims of other cultures and sects (whom our participants would encounter at the Hajj), but also people from other religions (who obviously would not be present at the Hajj). The phenomenon of generalizing positive effects of contact to other groups not actually present (the secondary transfer effect) is well established in the literature. Pettigrew (1997) suggests three mechanisms for such generalization to occur. First, the positive contact can improve people's ability to empathise with others generally. Second, rather than simply enabling learning about the specific outgroup, contact can promote identification with outgroups. Third, contact with outgroup members could lead to a reappraisal of the ingroup, whereby people realise that ingroup norms and customs are not the only ones of value in the wider world. In a study comparing different mechanisms, Tausch et al. (2010) found support for the role of generalization of attitudes from one group to another but less support for cognitive reappraisal.

Contemporary accounts of the mechanisms of positive contact suggest that shared social identification between groups is central (Brewer & Miller, 1984; Gaertner & Dovidio, 2000; Hewstone & Brown, 1986; for a recent review, see Tausch & Hewstone, 2010). In the present case, the specific form of identification we predicted would effect change is not strength of identification with an abstract superordinate social category, but *identification with the crowd* (see Figure 1). As Neville and Reicher (2011) show, while strength of social identification with a particular social category is the usual way social identity is measured, shared social identity with a co-present group or crowd is a better predictor of the psychological benefits of participation in such collectives (see also Hopkins et al., 2015). In the case of the Hajj crowd, a notable feature is its culturally and ethnically diverse membership. We therefore suggest that it is *crowd* identification that is the basis of more positive attitudes to cultural and ethnic outgroups.

Explaining Effects of the Hajj on Enhanced Muslim Identification

Our suggestions on the processes that might lead to *enhanced Muslim identification* are based on what is known about common experiences at Hajj, as documented in interview studies (Alnabulsi, 2015) and autobiographical accounts (e.g., Hammoudi, 2006), as well as relevant social scientific accounts of identity process and attitude change. A first kind of explanation for this self-change focuses on the sheer emotional experience of the Hajj. On the one hand, studies of collective emotion in other crowd events would suggest that the exultation generated by being part of the Hajj crowd might lead to greater commitment to the shared identity. Thus, across a variety of collective gatherings, Páez, Rimé, Basabe, Wlodarczyk, and Zumeta (2015) found that emotional synchrony and, to a lesser extent, optimal experience, mediated the effect of participation on strengthened collective identity. Hence, we predicted that *positive experience* in the Hajj crowd might predict *enhanced Muslim identification.* Based on the findings of Khan et

al.'s (2016) longitudinal study of the Hindu Magh Mela pilgrimage,[2] we expected this relationship to be mediated through *identification with the crowd* (see Figure 1).

On the other hand, certain aversive emotional experiences might play a complementary role. The theory of cognitive dissonance would suggest that greater physical discomfort (tiredness, heat etc.) experienced in striving to complete the rituals would lead people to shift their views to reflect the commitment they have shown to the shared spiritual values (Aronson & Mills, 1959; Gerard & Mathewson, 1966). Put differently, the strain we experience as part of participation can tell us something about ourselves and our values. A similar point has been made specifically about rituals involving shared pain. Thus, Whitehouse and Lanman (2014) reviewed evidence from ethnographic, archaeological, and historical research showing that shared dysphoric rituals create shared identification among participants; and Xygalatas et al. (2013) in a study of rituals in Mauritius showed that high-ordeal rituals predict both inclusive identification and prosocial behaviour, supporting a Durkheimian account of their social-cohesion function (see Durkheim, 1912/1995). The Hajj is a physically arduous experience involving standing, walking, and sometimes running in extremely high temperatures. Hence, we predicted that feelings of *exhaustion* in the Hajj crowd might predict *enhanced Muslim identification*, again mediated through *identification with the crowd* (after Khan et al., 2016) (see Figure 1).

A second type of explanation for *enhanced Muslim identification* has to do with the particular spiritual values embodied by the Hajj crowd. Peacefulness is one important spiritual value meant to prevail in the Hajj crowd (Shariati, 2005): "One had to remember the hadith 'No quarrelling during hajj'" (Hammoudi, 2006, p. 98). A second is unity (Shariati, 2005): "Humility, faith and unity are emphasized throughout the Hajj" (Memish et al., 2012, p. 62).

Thus, to the extent that pilgrims experience the crowd as embodying these values—a *peaceful crowd* and a *united crowd*—they should see the identity of the crowd as congruent with their spiritual identity, and hence they would more readily identify with the crowd. (For related proposals, see Oyserman, 2014; Sheldon, 2014; Sirgy, 1986; Swann & Burhmester, 2012.) Thus, we expected that experiencing each of these identity-congruent values being embodied in the crowd would be associated with *identification with the crowd* and thereby provide a further pathway to *enhanced identification as a Muslim* (see Figure 1).

Social Identity Definition and Enactment in the Crowd: A Further Potential Mediator of the Effects of the Hajj:

While perceived cooperation, intense emotional experiences, and embodiment of Muslim values each should predict a greater sense of shared identity with the crowd itself, we considered that there might be a second, closely related, mediator from some of the predictors to experiences of self-change: *enactment of one's identity as a crowd member*. Thus, factors such as perceived cooperation among pilgrims and the crowd's embodiment of spiritual values enable participants to put into practice their most valued shared beliefs – that, is to *enact* their identities in tangible ways, a process called collective self-objectification (Drury & Reicher, 2005) or collective self-realization (Khan et al., 2016).

Extending the principle of self-categorization theory that social contextual features influence identity salience (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), Neville and Reicher (2011; Reicher, 2011) reasoned that realization of identity in the form of tangible practices makes that identity more *meaningful* to participants; this, they suggest, increases strength of social identification. In line with this reasoning, Khan et al. (2016) found that pilgrims' shared social identity with the crowd predicted increased social identification as a

Hindu, mediated by collective self-realization. A similar logic is apparent in the social identity model of "deindividuation" effects (Klein, Spears, & Reicher 2007), self-verification theory (Swann & Buhrmester, 2011), and motivated identity construction theory (Vignoles, 2011). According to these perspectives, enacting an identity makes that identity recognizable to others, who may then provide feedback that affirms the identity, resulting in a mutually reinforcing feedback loop between identity definition and identity enactment (see Swann & Bosson, 2008; Vignoles, 2019).

How should identity-enactment be observed and operationalized in the context of the Hajj? Given that being helpful to other pilgrims is an important spiritual value expected of good Muslims at Hajj (e.g., Nigosian, 2004), we suggest that *giving support* to other crowd members is an important way of enacting one's identity as a member of the Hajj crowd. Thus, we expected that *giving support* would be closely related to *identification with the crowd*, and that these variables might play parallel mediating roles in explaining the links between experiences and perceptions of crowd membership and experiences of self-change (see Figure 1).

Surveying the Hajj

Despite its size and global significance, the Hajj has barely featured in psychology research. A recent PsychInfo search for peer reviewed journal articles with "Hajj" in the abstract turned up only 31 results, and almost none of these were concerned with social psychological processes. One reason for this dearth of psychology research is that access to Mecca is closed to non-Muslims. In addition, large-scale research on this event is a major undertaking given the multiple languages among pilgrims. To deal with this in our study of the 2012 Hajj, we employed and trained a group of religious students to act as research assistants for our questionnaire survey. The students were native speakers of the seven main languages of pilgrims

attending the Hajj – Arabic, Malay, Urdu, French, Persian, Turkish, and English – and we sought to sample pilgrims speaking these languages broadly in proportion to their representation at the Hajj, as indicated by figures from previous research (Abdelrhman, 2011). Through this strategy, we also hoped to sample across the range of different nationalities and cultural groups present at the Hajj. Pilgrims completed the questionnaire in and around the Grand Mosque, Mecca, which is the most sacred place in Islam.

Based on the literature reviewed above, the hypotheses we tested with the survey can be summarized as follows. First, we expected that each of *perceived cooperation*, *positive experience*, *exhaustion*, perception of a *peaceful crowd* and perception of a *united crowd* would predict both *identification with the crowd* and *giving support*. Second, we expected that both *identification with the crowd* and *giving support* should predict *increased positive attitudes to outgroups* and *enhanced Muslim identification*. We expected *identification with the crowd* and *giving support* to covary. We expected indirect relationships between *perceived cooperation* and *increased positive attitudes to outgroups*. We also expected indirect relationships between, on the one hand, each of *positive experience*, *exhaustion*, perception of a *peaceful crowd* and perception of a *united crowd* and, on the other, *enhanced Muslim identification.* Since these theorised indirect relationships share common mediators, we also examined all other potential mediation pathways within our model (see Figure 1).

Assessing Psychological Change at the Hajj

The analysis presented here is part of a larger questionnaire survey study in which we also examined other topics (see also Alnabulsi & Drury, 2014). Admittedly, since our design is cross-sectional, it is less able to support causal claims than Clingingsmith et al.'s (2009) natural experiment. On the other hand, what it is able to provide, which that study could not, is a test of

hypotheses about the role of identification with the crowd, and other crowd processes, in experiences of self-change. Note that assessing these crowd processes in a "control group" of participants who did not experience the crowd would be nonsensical; and so a correlational study of those who did attend the Hajj is the only viable way of testing quantitative predictions about the role of these processes in experiences of self-change.

The nature of the study also meant that the only way to measure change itself was to measure self-reported change – that is, by asking people the extent to which they had experienced changes in their Muslim identification and in their attitudes to outgroups. Given that part of the purpose of the Hajj is to renew and remake the pilgrim as a more spiritual person, it is possible that our participants might draw upon a narrative of ideal self-change rather than report the extent to which they have actually changed. In a context where psychological change is valued, we recognize that asking people whether they have changed might encourage them to (over)report change (e.g., Frazier et al., 2009).

There are several points to make about this. First, as described earlier, the occurrence of lasting psychological change through participation in the Hajj is already established (Alexseev & Zhemukhov, 2015; Clingingsmith et al., 2009). The purpose of the present study was not to measure the average magnitude of change, therefore, but to explain some of the processes behind it, by looking at variability in reported experiences of change. Second, using self-reports as an indicator of the extent of change experienced by each individual allowed us to reach a much larger and more representative sample than could possibly be achievable using other approaches. Third, unlike studies that ask participants to self-report on changes retrospectively, sometimes long after the events occurred, here we had a unique opportunity to ask participants about changes that they were experiencing in the immediate context of the Hajj itself. Fourth, as

illustrated by the account of Malcolm X (1965) with which we began this paper, these immediate experiences are of interest in themselves, as transformative psychological processes "in the moment" that may in due course be translated into self-defining memories that shape one's future identity, life-course and behaviours (e.g., Singer & Blagov, 2004). Fifth, we rule out some possible artefactual explanations for our findings by using latent variables and controlling for acquiescent responding in the measurement part of our structural models. In sum, whether or not the overall magnitude of change is exaggerated, we suggest that individual variability in the reporting of experienced self-changes in identification and attitudes is meaningful and potentially highly consequential, and our study seeks to explain a substantial part of that variability.

Method

Recruitment Procedure

Our recruitment strategy involved training twelve research assistants to each approach an opportunity sample of pilgrims. The research assistants were religious students from Umm Al-Qura University, Mecca, which helped us recruit them and paid them an allowance. They were native speakers of the seven major languages present at the Hajj. Each assistant was assigned a quota of participants to recruit.

The research assistants approached pilgrims in the Grand Mosque and plaza area immediately outside, using verbally-administered paper copies of the questionnaires. Pilgrims were not offered a reward but were told that the research was intended to contribute to enhancing the safety management and experience of the Hajj (since part of the questionnaire concerned safety and relations with Saudi personnel). Each questionnaire took around 38 minutes to complete.

Pilgrims were often reluctant to participate, since our request interfered with their worship. Response rates were roughly sixty per cent in the Mosque and seventy per cent in the plaza. There were demographic factors in the response rate. Younger pilgrims were relatively more willing to participate than other pilgrims. Some refused to participate because they were illiterate; they sometimes passed us to a relative instead. Women were more likely to refuse than were men. The research assistants were male, which would have affected recruitment of females, given Islamic conventions. To counter this, three of the assistants were accompanied by their wives.

Participants

We surveyed a total of 1194 pilgrims. Three hundred and eighty-three (32.5%) participants were sampled in the nine days before the Hajj rituals, when pilgrims came to the mosque for their first *tawaf*; 533 (45.2%) were sampled during Hajj over 3 days; and 260 (22.0%) were sampled at *tawaf* in the six days after the Hajj rituals.[3] (Information on the time and location of 4 participants was missing.) Four hundred and twenty one (35.7%) were surveyed inside the Grand Mosque and 753 (64.0%) on the plaza immediately outside.

The data for 18 participants were entered incorrectly by one research assistant. As there was no way subsequently of being sure what the correct entries should have been, these participants were removed from the sample, leaving 1176 participants.

Four-hundred and twenty (35%) participants were Arabic speakers, 150 (13%) were speakers of Malay, 150 (13%) of Urdu, 120 (10%) of French, 120 (10%) of Persian, 120 (10%) of Turkish, and 114 (9%) of English. Seven hundred and fifty-nine (64.2%) of the participants were male and 419 (35.5%) were female. This matches the proportion of males to females in the population attending Hajj in 2012 (Ministry of Economy and Planning, Central Department of

Statistics and Information, Saudi Arabia, 2014). The study included participants from 72 countries. Those nationalities represented by 15 or more participants are presented in Table 1.

----------Insert Table 1 about here----------

The majority of pilgrims attend through arrangement with six Hajj travel establishments, or travel agencies, which are structured by country or geographical region. In most cases, the proportion in our sample from each establishment roughly corresponded with official estimates for the event as a whole (our sample: Arab and Arabian Gulf countries 35.7%; America, Australia, and Europe (including Turkey) 18.7%; South Asia 14%; South East Asia 11.6%; Iran and Tajikistan 10.3%; non-Arab African Countries 8.7%. Official estimates: Arab and Arabian Gulf countries 23%; America, Australia, and Europe (including Turkey) 14%; South Asia 29%; South East Asia 16%; Iran and Tajikistan 4%; non-Arab African Countries 11%; Ministry of Economy and Planning, 2014; Ministry of Hajj, 2013).

The modal age-range for both male and female participants was 40-49 years. Across the sample, 17 participants (1.4%) were aged between 18 and 20 years old; 98 (8.3%) were aged 20 to 29; 223 (18.9%) were aged 30 to 39, 459 (38.7%) were aged 40 to 49, and 381 (32.3%) were aged 50 years and over.[4] Sixty-six participants (5.6%) were illiterate, 197 (16.7%) were educated to "read and write" level, 193 (16.4%) to primary school level, 239 (20.3%) to secondary school level, 395 (33.5%) to undergraduate degree level, 78 (6.6%) had Master's degrees, and 8 (0.7%) had doctorates. Seven hundred and eighteen (60.8%) were employed, 360 (30.5%) were retired and 98 (8.3%) were not employed. Three hundred and sixty-eight (31.3%) had been on Hajj before, whereas for 808 (68.7%) this was their first Hajj. Most were attending the pilgrimage in a group; just 160 (13.6%) indicated that they were attending alone.

Measures

Measures were included as part of a larger survey (Alnabulsi, 2015; Alnabulsi & Drury, 2014).[5] The questionnaire was developed in English and translated into Arabic, French, Urdu, Persian, Turkish, and Malay. All versions were also translated from these different languages into Arabic, the first author's first language, in order to check the quality of translation.

Given the challenges of collecting data within such a huge and mobile mass gathering, most constructs in our model were represented with short measures. All items were anchored by 1 (*strongly disagree*) and 7 (*strongly agree*). Below, we report Cronbach's α for measures with 3 or more items and Spearman-Brown split-half reliability coefficients ($\rho_{S\text{-}B}$) for 2-item measures (Eisinga, te Grotenhuis, & Pelzer, 2013). Moreover, as described below, we accounted for measurement error by modelling all constructs as latent variables, and we included a method factor to control for possible confounding effects of acquiescent responding.

Enhanced Muslim identification was measured using three items (α = .78), which we constructed based on Clingingsmith et al. (2009): "Compared to before you came to Hajj: Is your Muslim identity now more important to you?", "… Do you now feel more unity with other Muslims?", "… Do you now feel more harmony with other Muslims?"

Increased positive attitudes to outgroups was measured using two items ($\rho_{S\text{-}B}$ = .72) also based conceptually on Clingingsmith et al. (2009): "Compared to before you came to Hajj: Do you now feel more harmony with people with different religions?" and "… Are you now more positive towards people from different cultures?"[6]

Identification with the crowd was measured with five items (α = .83): "I feel at one with the people around me", "I feel that I am part of this crowd", "I feel a sense of togetherness with other people on the Hajj", "I feel unity with others", and "I feel strong ties with other people in

the Hajj". The precise wording of these items was developed for this study, but the concept of identification with and among co-present others, in contrast to identification with a wider social category (such as Muslims), is based on Neville and Reicher (2011) and Khan et al. (2016). The items are adapted from those in commonly used scales by Doosje, Branscombe, Spears and Manstead (1998) and Doosje, Ellemers and Spears (1995) and which are defined by Leach et al. (2008) as the "solidarity" dimension of social identification.

Giving support was measured initially with three items (α = .68) constructed for this study, partly based on items used in previous research on social support in mass events (Drury et al., 2016): "I am willing to help others on the Hajj who need support", "I have been helpful to others", and "I have shown concern for others' needs". (The survey section containing these items was prefaced with a statement, "Now we would like to ask you about supportive behaviour on the Hajj"; thus, it would have been clear to participants that all three items referred specifically to giving support to others on the Hajj rather than to giving support in general.) However, the first item showed a substantial cross-loading on perceived cooperation in our initial measurement model (see below). Notably, the problematic item was about willingness to give support, whereas the other two items were self-reports of having given support—and thus closer to the theoretical construct that we wanted to measure. We therefore concluded that a two-item measure was conceptually and statistically preferable ($\rho_{S\text{-}B}$ = .66).

Perceived cooperation was measured with three items (α = .78): "In my view, most pilgrims are supportive of others", "In my view, most pilgrims are respectful of others", "If I need help, other pilgrims would help me". These were constructed for this study; the third item was based on measures of expected social support used in previous research (Drury, Brown, González, & Miranda, 2016; Drury, Novelli, & Stott, 2015).

Positive experience in the crowd was measured with six items constructed for this study (α = .91): "I feel enthusiastic to be part of this crowd", "I am enjoying being in this crowd", "I feel good being part of the Hajj crowd", "I am glad to be part of this crowd", "Being in the Hajj crowd is a positive experience for me" and "My desire is to be part of the Hajj crowd". These items were similar to those used in previous research looking at positive experience in crowd events (Novelli, Drury, Reicher, & Stott, 2013).

Exhaustion was measured using two items constructed for this study ($\rho_{S\text{-}B}$ = .79): "I feel physically exhausted in this crowd", "I feel emotionally exhausted in this crowd."

Perception of a *peaceful crowd* was measured with two items constructed for the present study ($\rho_{S\text{-}B}$ = .70): "On the whole, the Hajj crowd is peaceful" and "On the whole, the Hajj crowd is not aggressive."

Perception of a *united crowd* was measured with two items constructed for the present study ($\rho_{S\text{-}B}$ = .64): "This crowd is united with each other" and "There is a sense of togetherness in this crowd".

Demographic and other measures. Among other demographic data, participants reported their age, gender, educational level, whether this was their first time attending the Hajj, and whether they were attending alone or in a group.

Acquiescent responding. Our main substantive measures included no reversed items, and so it was important to avoid the possibility that our findings might be contaminated by individual or cultural differences in use of the response scale (Podsakoff, MacKenzie, & Podsakoff, 2012; Smith et al., 2016). As described below, we adjusted our measures for acquiescent responding by including a method factor in all statistical models. To define this method factor, we used four pairs of conceptually-opposed items that were unrelated to our current theorizing. For example,

the extent to which a participant agrees *both* that there is enough space *and* that it is too crowded provides an indicator of their tendency to use the agree end of the response scale irrespective of item content. Indicator 1 was the average of "There is enough space for everyone" and "It is too crowded here"; Indicator 2 was the average of "I feel safe at *tawaf*" and "*Tawaf* is dangerous"; Indicator 3 was the average of "On the whole, the Saudi staff treat us fairly" and "The Saudi staff are hostile to us"; Indicator 4 was the average of "The Saudi authorities provide appropriate information for us" and "The Saudi authorities are not communicating adequately with us". Each pair of items was averaged without reverse coding either item.

Analytical Considerations and Measurement Models

Analyses were conducted using Mplus 6 (Muthén & Muthén, 1998-2010). To account for measurement error and thus estimate structural paths more precisely in our main analysis, we modelled all constructs as latent variables with the relevant items as indicators. For all analyses, we used the TYPE = COMPLEX function in Mplus to produce corrected standard errors that account for the clustering of participants into different nations of origin. All models were computed using robust maximum likelihood estimation (Satorra & Bentler, 1994), which adjusts for non-normality in the indicator variables. We assessed model fit using the Standard Root Mean Squared Residual (SRMR), Root Mean Square Error of Approximation (RMSEA), and Comparative Fit Index (CFI). Based on recommendations in the literature, we interpreted values of SRMR < .08 (or < .10), RMSEA < .06 (or < .08), and CFI < .95 (or < .90) as evidence of "good" (or "acceptable") fit (Hu & Bentler, 1999; Kline, 2005). Note, however, that these are rules of thumb to aid interpretation, and they should not be misinterpreted as absolute criteria to accept or reject a model (Kenny & McCoach, 2003; Marsh, Hau, & Wen, 2004).

Prior to our main analyses, we tested and slightly refined the measurement model, to ensure that we were using the best-performing items across our linguistically and culturally heterogeneous sample. To test and optimize the performance of our measures in a culturally and linguistically diverse sample, we first estimated a measurement model with nine substantive factors and a method factor of acquiescent responding. All items were allowed to load on their target factors, as specified above. To ensure that all factors were locally just-identified, we specified a fixed loading of 1 for the first item loading on factors with three or more items and we specified a fixed loading of 1 for both items loading on factors with two items (Little, Lindenberger, & Nesselroade, 1999; Steiger, 2002). All substantive items also cross-loaded on the method factor, with every loading on this factor fixed at 1; as recommended in the literature, acquiescent responding was allowed to covary with the substantive factors (Welkenhuysen-Gybels, Billiet, & Cambré, 2003). The substantive factors were thus defined by variance in the items that was not attributable to differences in scale usage. No other cross-loadings and no residual covariances were allowed in any of our models.

Confirming the adequacy of our measures, an initial measurement model with no modifications showed acceptable fit: χ^2 (426) = 1020.692; CFI = .918; RMSEA = .034 (90% confidence interval [CI]: .032, .037); SRMR = .047. Within this model, all items loaded as expected on their target factors (all standardized $\lambda > .58$; all $p < .001$). However, modification indices suggested a high potential cross-loading of .419 for one item in our *giving support* measure (see above), and so this item was removed from subsequent analyses, yielding a model with slightly improved fit indices: χ^2 (397) = 872.563; CFI = .932; RMSEA = .032 (90% confidence interval [CI]: .029, .035); SRMR = .045. All standardized loadings remained $\geq .58$, and modification indices suggested no potential cross-loadings > .3. Thus, all items loaded

cleanly on their target factors, providing confidence in the suitability of these measures for testing our predictions.[7]

Results

Correlations

Table 2 shows that, as expected, most correlations were positive. *Social identification with the crowd* was correlated positively with all variables except *exhaustion*. *Giving support* was correlated positively with both self-change variables, *social identification with the crowd*, and *perceived cooperation*. Notably, after adjusting for acquiescent responding, *exhaustion* showed a stronger negative correlation with *positive experience*, and it no longer correlated positively with most other variables in the model. These differences suggest that our acquiescent responding method factor worked as intended, improving the conceptual precision of our latent variables by removing extraneous variance due to differences in use of the response scale.

----------Insert Table 2 about here----------

Structural Equation Model

We tested our predictions using a structural equation model based on the logic of Figure 1. Experiences and perceptions of crowd membership (*peaceful crowd*, *unity, positive experience*, *perceived cooperation,* and *exhaustion*) were modelled as predictors of *identification with the crowd* and of *giving support*; these two variables were modelled as predictors of *enhanced Muslim identification* and *increased positive outgroup attitudes*. As is conventional when testing mediation, we also included direct paths from the five measures of experiences and perceptions to *enhanced Muslim identification* and *increased positive outgroup attitudes*. All of these paths were modelled while controlling for demographic variables (age, gender, education), previous attendance of the Hajj, whether the participant was attending alone or in a group, and the period

of data collection (before, during or after the main ritual, coded with two dummy contrasts). We retained the method factor to account for acquiescent responding, and we continued to allow this to covary freely with the substantive factors. We allowed all predictors and control variables to covary freely. We also modelled a covariance between the two potential mediators, *identification with the crowd* and *giving support*, and a covariance between the two outcome variables, *enhanced Muslim identification* and *increased positive outgroup attitudes*.

Figure 2 summarizes the main findings from this model. The complete set of structural parameter estimates is reported in Table 3 (direct paths), Table 4 (covariances), and Table 5 (indirect paths). The model showed an acceptable fit to the data, χ^2 (544) = 1261.399; CFI = .909; RMSEA = .034 (90% CI: .031, .036); SRMR = .044, and accounted for 40.2% of the variance in *identification with the crowd*, 41.1% of the variance in *giving support*, 24.0% of the variance in *enhanced Muslim identification*, and 20.1% of the variance in *increased positive outgroup attitudes*.

---------- Insert Figure 2 about here ----------

---------- Insert Tables 3, 4 and 5 about here ----------

Direct Paths

As shown in Figure 2 and Table 3, *perceived cooperation*, *positive experience*, and perceptions of a *united crowd* each significantly predicted *identification with the crowd* (βs from .196 to .474; all $p < .001$), and *perceived cooperation* also predicted *giving support* (β = .510; $p <$ 001). On the other hand, *exhaustion* did not significantly predict either of these variables (both $p \geq .195$), and perceptions of a *peaceful crowd* showed a weak negative association with *giving support* ($p = .035$).[8] *Identification with the crowd* in turn predicted both self-change variables (β's ≥ .278; both $p < .001$). As expected, *giving support* covaried significantly with *identification*

with the crowd ($p < .001$ [see Table 4]); however, *giving support* did not directly predict either of the self-change variables (both $p \geq .129$).[9]

Indirect Pathways

Combining these significant effects, we found evidence of several significant indirect pathways from experiences and perceptions of crowd membership to experiences of self-change, as shown in Table 5. Notably, all significant indirect pathways were mediated through *identification with the crowd*. First, *perceived cooperation* showed indirect effects on self-change through two significant predicted pathways: *perceived cooperation* → *identification with the crowd* → *enhanced Muslim identification* (Standardized Parameter Estimate [*SPE*] = .132, *SE* = .024, $p < .001$, 95% CI: .084, .179) and *perceived cooperation* → *identification with the crowd* → *increased positive outgroup attitudes* (*SPE* = .143, *SE* = .038, $p < .001$, 95% CI: .068, .218).

Second, *positive experience* showed significant effects on self-change also through two significant predicted pathways: *positive experience* → *identification with the crowd* → *enhanced Muslim identification* (*SPE* = .054, *SE* = .017, $p < .01$, 95% CI: .020, .088) and *positive experience* → *identification with the crowd* → *increased positive outgroup attitudes* (*SPE* = .059, *SE* = .014, $p < .001$, 95% CI: .031, .087).

Third, perceptions of a *united crowd* similarly showed indirect effects on self-change through two significant predicted pathways: *united crowd* → *identification with the crowd* → *enhanced Muslim identification* (*SPE* = .060, *SE* = .017, $p < .001$, 95% CI: .028, .093) and *united crowd* → *identification with the crowd* → *increased positive outgroup attitudes* (*SPE* = .065, *SE* = .022, $p < .01$, 95% CI: .023, .108).

In sum, associations of perceptions and experiences of the crowd with both dimensions of experienced self-change were largely explained by feelings of *identification with the crowd*.

Since we found no significant direct paths from perceptions and experiences of the crowd to either self-change outcome, nor did we find significant indirect pathways through *giving support*, the data are consistent with a view of *identification with the crowd* as fully mediating these associations.

Discussion

These results suggest some of the processes that might account for previous observations that attending the Hajj can change pilgrims towards both greater commitment to their Muslim identity and more positive attitudes to other groups. Previous observations have been autobiographical, anecdotal, or have only measured change with limited samples after the event and without examining process (Alexseev & Zhemukhov, 2015; Clingingsmith et al., 2009). By contrast, we surveyed pilgrims when they were at the Hajj, and we took measures of likely process factors.

The indirect association we found between *perceived cooperation* and *more positive attitudes to outgroups* both within and outside the *Ummah*,[10] is consistent with the idea, based on the contact literature (Allport, 1954) and as suggested by Clingingsmith et al. (2009), that cooperative interaction with others leads to more positive views of other groups at the Hajj. Further, the fact that this association was mediated by *identification with the crowd* is in line with social identity based contact theories, in particular the notion of common ingroup identification (Gaertner & Dovidio, 2000), although here is it *the diverse crowd* (rather than a more abstract superordinate social category) that operates as the common ingroup. Given that our self-report measure of attitude change included reference to other religions as well as other cultures, this is evidence of a secondary transfer effect (Tausch et al., 2010).

The role of *identification with the crowd* as the proximal predictor of *increased positive outgroup attitudes* meant that other experiences of the Hajj were also found to have indirect effects. Both emotion (in the form of *positive experience*) and Muslim spiritual values embodied in the crowd (in the form of perceptions of *unity*) predicted *more positive attitudes to outgroups* via *identification with the crowd*.

The evidence for the predictors of *enhanced Muslim identification* was mixed. On the one hand, as expected *positive experience* predicted *enhanced Muslim identification* indirectly, via *identification with the crowd*. The significant pathway between positive experience and (crowd) identification is in line with previous research on the psychosocial effects of mass gatherings (Páez et al., 2015). On the other hand, aversive experience (*exhaustion*) predicted neither enhanced Muslim identification nor the mediators, a result which appears to be in contrast to some previous research on rituals and identification (e.g., Whitehouse & Lanman, 2014).

Experiencing the crowd as embodying spiritual values produced different results depending on the particular value. Perceiving a *peaceful crowd* was not associated with either of the mediators or with *enhanced Muslim identification*. Perceiving a *united crowd* predicted *enhanced Muslim identification* via *identification with the crowd*, as expected. The results for perceiving unity, but not those for peacefulness, are therefore in line with theories of self-congruence (e.g., Oyserman, 2014; Sheldon, 2014; Sirgy, 1986; Swann & Burhmester, 2012), which might suggest that experiencing a crowd embodying identity-congruent values would increase identification with that crowd and thereby enhance commitment to the values of the social category the crowd represents.

The results overall suggest that the two types of experiences of self-change (outgroup attitudes and ingroup identification) seem to operate through the same mechanism. The finding

of a relationship between *identification with the crowd* and enhanced identification with the wider (religious) social category partially replicates Khan et al.'s (2016) finding from a study of a Hindu pilgrimage; but we also extend Khan et al.'s finding, first by showing some of the predictors of this *identification with the crowd* (i.e., perceptions of a *united crowd*, *positive experience*, and *perceived cooperation*) and second by showing that positive attitudes to outgroups can also be enhanced by the same process.

We found that *giving support* covaried with *identification with the crowd*, but did not operate as a mediator in the way we expected. *Giving support* was predicted positively by *perceived cooperation*, but was not associated with either of the outcome measures. In their study, Khan et al. (2016) asked people directly whether they felt they had enacted their identity, whereas we took reports of *giving support* as an indicator of such identity enactment; this methodological difference might explain why they found that enactment predicted enhanced religious ingroup identification but we did not.

Of the distal predictors, *perceived cooperation* was found to be particularly important, for it was associated with both mediators and both forms of self-change. Among our five measures of perceptions and experiences in the crowd, *perceived cooperation* showed the largest correlations with all social identity processes and experienced self-change variables, the largest standardized paths to both social identity processes, and the largest indirect paths to both experienced self-change variables.

Clingingsmith et al. (2009) found evidence that literacy among pilgrims increased experiential knowledge of other cultural groups. In contrast, we did not find level of education to be a predictor of experiences of self-changes (see Table 3). Following up another suggestion of Clingingsmith et al., prior experience of the Hajj did not directly predict self-change experiences;

however, it did predict identification with the crowd (see results for *first attendance* in Table 3), and thus prior experience contributed indirectly to both self-change experiences.[11] Also, both education and prior experience did predict *giving support*. The one direct demographic predictor of self-change experiences that we identified was age – the older the pilgrim, the more likely they were to report increased positive outgroup attitudes (Table 3).

One question arising from this analysis concerns whether the effects of the Hajj in creating experiences of self-change are also found in other religious gatherings. The strengthening of commitment to the religious identity would appear to be a generic effect of shared identity in any crowd enacting a spiritual ritual; this is suggested both by theory and by the evidence that similar effects have been found in two different types of religious event – i.e. both the Hajj and the Mela. But should we also expect the finding of enhanced positive attitudes to other groups to occur in other religious mass rituals? Khan et al. (2016) did not examine attitudes to other groups, and there seems no particular reason to expect this at the Hindu Mela they investigated, where the population is much more homogeneous (i.e. predominantly high-caste Indians) than at the Hajj.

In order to begin to answer this question of the generality of change in attitudes to other groups, it is necessary to distinguish between identity process and identity content. Effects of identity-congruent practice on commitment to the values of identity are at the level of *process*. The nature of that practice (i.e., which particular norms are embodied) is at the level of identity *content*, and it is the precise content of the shared identity which will determine the extent to which such enhanced commitment is associated with changes in other attitudes. Among the values the Hajj is meant to embody is unity across the diverse peoples of the Muslim *Ummah* (e.g., Memish et al., 2012; Shariati, 2005). This is reinforced by the experience of cultural variety

(including even doctrinal differences about the correct way to be a Muslim) being subsumed within the common purpose of communal Hajj rituals (as illustrated in the Malcolm X quotation at the beginning of this article). Thus, we would expect to see similar results to those presented here at those religious mass gatherings where unity and equality across diversity are spiritual values, but no such change to more positive intergroup attitudes where these values are not associated with the common identity. This argument might be tested systematically in a future study.

The present findings contribute to a growing psychology of not only mass pilgrimages (e.g., Hopkins et al., 2015; Khan et al, 2014, 2016; Pandey et al., 2014; Tewari, Khan, Hopkins, Srinivasan, & Reicher, 2012) but also other mass gatherings (Drury et al., 2015), which has demonstrated the role of shared social identity in crowds in relation to a range of phenomena, including feelings of safety in dense crowds (Alnabulsi & Drury, 2014), health and wellbeing (Hopkins & Reicher, 2016), and sensory processes (Shankar et al, 2013). Beyond the psychology of one particular religious mass gathering, we suggest that examining psychological change at the Hajj can tell us about crowds and their ability to remake identities (Reicher & Drury, 2011). Hitherto, the idea that crowds form (and re-form) identities has been most extensively researched in studies of collective action (e.g., Drury & Reicher 2000; Van Zomeren, Leach, & Spears, 2012). The present investigation, along with other recent studies in psychology (Khan et al., 2016; Xygalatas et al., 2013) and other disciplines (Whitehouse & Lanman, 2014), shows that ritual crowds also have this potential.

One of the strengths of the analysis presented here is that it is based on a sample that was relatively representative of the Hajj crowd, in terms of both gender and language group. What is more, recruitment and participation in the questionnaire took place in Mecca during the Hajj

itself. Participants were not recalling from memory how they felt but were reporting experiences *in vivo*. Taken together, these points mean that this study is relatively strong on both generalizability (at least for Hajj crowds) and ecological validity.

Before concluding, however, there are some limitations that need to be mentioned. As with many survey designs, the results here are correlational. Although the sequence of relations tested here made theoretical sense and is justified empirically, other causal sequences are possible. Similarly, other factors beyond those included here surely play a critical role. For example, institutional and ideological support may be important factors in psychological change in religious mass gatherings, just as they are in other examples of successful intergroup contact (Allport, 1954).

The fact that evidence of change in the present study is based on self-reported experiences of change "in the moment" during the Hajj is both a strength and a limitation of the study. Although highly challenging to carry out, an ideal study would go beyond this approach by looking also at the behaviour of pilgrims not only during the Hajj period but afterwards. Such a long-term behavioural study could add some information to the present findings on the endurance of these reported changes in identification and attitudes, linking our current findings with the downstream consequences previously demonstrated by Clingingsmith et al. (2009), as well as testing the consequentiality of these psychological changes for group and intergroup actions.

For practical reasons, the questionnaire was relatively short, meaning that the measures were based on small numbers of items. Some of the items were constructed for this study, rather than based on previously validated measures. Arguably, to measure the effects of contact, there should have been items measuring how much interaction the participants had with others at the

Hajj, separate from the extent to which this contact was cooperative. For reasons of brevity, we asked only about the latter. However, since the positive (i.e., cooperative) form of contact is the mechanism of change according to the contact approach, we suggest that it is legitimate to interpret the measure as providing a test of the contact hypothesis.

One further caveat is necessary. Participants' perceptions of unity in the crowd should not be taken as a claim that the Hajj is characterized only by unity. Alongside accounts of harmony among pilgrims, scholarly accounts of the Hajj note both differences among sects (characterized by disrespect and hostility) and inequality between social categories (not least women and men), as well as occasional displays of personal selfishness (Hammoudi, 2006).

A prevalent representation of Islam in the West is of intolerance and even violence (Ahmed & Matthes, 2017), and the Hajj itself is often associated in public discourse with disaster in the form of so-called "stampedes" (Sim & Mackie, 2015). The present study offers a positive picture of the potential of the Hajj for psychological change and for harmony between different groups. It therefore also suggests an alternative perspective to contemporary arguments around the supposed inherent intolerance of Islam and the possible dangers (to the West) of Muslim mass gatherings.

Ethics

The study protocol was approved by the Ethical Committee, Custodian of the Two Holy Mosques Institute of Hajj Research, Umm Al-Qura University (Mecca) Saudi Arabia, and by the University of Sussex, Brighton, United Kingdom in July 2012. All participants provided their written informed consent before participation.

Data Accessibility

The original SPSS data-set is available on Figshare: https://figshare.com/articles/HAJ3317aORIGINALDATASET_sav/5406403

References

Abdelrhman, A. M. (2011). *Questionnaire about Hajjis' views about new development expansions in Makkah El Mokramah 1432h*. Makkah, Kingdom of Saudi Arabia: Umm Al-Qura University, Custodian of the Two Holy Mosques Institute of Hajj Research.

Ahmed, S., & Matthes, J. (2017). Media representation of Muslims and Islam from 2000 to 2015: A meta-analysis. *International Communication Gazette, 79*, 219-244. doi.org/10.1177/1748048516656305

Alnabulsi, H. (2015). *The crowd psychology of the Hajj*. Unpublished PhD thesis, University of Sussex, UK

Alnabulsi, H., & Drury, J. (2014). Social identification moderates the effect of crowd density on safety at the Hajj. *Proceedings of the National Academy of Sciences, 111*(25), 9091-9096. doi: 10.1073/pnas.1404953111

Alnabulsi, H., Drury, J., & Templeton, A. (2018). Predicting collective behaviour at the Hajj: Place, space, and the process of cooperation. *Philosophical Transactions of the Royal Society B.* 373: 20170240. DOI: 10.1098/rstb. 2017. 0240

Alexseev, M. A., & Zhemukhov, S. N. (2015). From Mecca with tolerance: Religion, social recategorisation and social capital. *Religion, State & Society, 43*, 371-391. doi.org/10.1080/09637494.2015.1127672

Ali, A. H. (2015, July/August). A problem from heaven: Why the United States should back Islam's reformation. *Foreign Affairs, 94*.

Allport, G. W. (1954). *The nature of prejudice*. Reading, MA: Addison-Wesley.

Aronson, E. & Mills, J. (1959). The effect of severity of initiation on liking for a group. *The Journal of Abnormal and Social Psychology, 59*, 177-181. doi.org/10.1037/h0047195

Brewer, M. B., & Miller, N. (1984). Beyond the contact hypothesis: Theoretical perspectives on desegregation. In N. Miller & M. B. Brewer (Eds.), *Groups in contact: The psychology of desegregation* (pp. 281-302). Orlando, FL: Academic Press.

Clingingsmith, D., Khwajam, A.I. & Kremer, K. (2009). Estimating the impact of the Hajj: Religion and tolerance in Islam's global gathering. *The Quarterly Journal of Economics, 124*, 1133-1170. doi.org/10.1162/qjec.2009.124.3.1133

Doosje, B., Branscombe, N. R., Spears, R., & Manstead, A. S. R. (1998). Guilty by association: When one's group has a negative history. *Journal of Personality and Social Psychology, 75*, 872–886.

Doosje, B., Ellemers, N., & Spears, R. (1995). Perceived intragroup variability as a function of group status and identification. *Journal of Experimental Social Psychology, 31*, 410–436. https://doi.org/10.1006/jesp.1995.1018

Drury, J., Brown, R., González, R., & Miranda, D. (2016). Emergent social identity and observing social support predict social support provided by survivors in a disaster: Solidarity in the 2010 Chile earthquake. *European Journal of Social Psychology, 46*, 209–223. doi: 10.1002/ejsp.2146

Drury, J., Novelli, D., & Stott, C. (2015). Managing to avert disaster: Explaining collective resilience at an outdoor music event. *European Journal of Social Psychology, 4*, 533–547. doi: 10.1002/ejsp.2108

Drury, J., & Reicher, S. (2000). Collective action and psychological change: The emergence of new social identities. *British Journal of Social Psychology, 39*, 579-604. DOI: 10.1348/014466600164642

Drury, J., & Reicher, S. (2005). Explaining enduring empowerment: A comparative study of collective action and psychological outcomes. *European Journal of Social Psychology, 35,* 35-58. DOI: 10.1002/ejsp.231

Durkheim, E. (1995). *The elementary forms of religious life* (K. E. Fields, Trans.). New York, NY: Free Press. (Originally published 1912)

Eisinga, R., te Grotenhuis, M., & Pelzer, B. (2013). The reliability of a two-item scale: Pearson, Cronbach, or Spearman-Brown? *International Journal of Public Health, 58*, 637-642. DOI: 10.1007/s00038-012-0416-3

Frazier, P., Tennen, H., Gavian, M., Park, C., Tomich, P., & Tashiro, T. (2009). Does self-reported posttraumatic growth reflect genuine positive change? *Psychological Science, 20*, 912-919. doi: 10.1111/j.1467-9280.2009.02381.x

Gaertner, S. L., & Dovidio, J. F. (2000). *Reducing intergroup bias: The common ingroup identity model*. Philadelphia, PA: Psychology Press.

Gerard, H. B., & Mathewson, G. C. (1966). The effects of severity of initiation on liking for a group: A replication. *Journal of Experimental Social Psychology, 2*, 278–287. doi.org/10.1016/0022-1031(66)90084-9

Hammoudi. A. (2006). *A season in Mecca*. Cambridge, UK: Polity Press.

Hewstone, M., & Brown, R. J. (1986). Contact is not enough: An intergroup perspective on the contact hypothesis. In M. Hewstone & R. J. Brown (Eds), *Contact and conflict in intergroup encounters* (pp. 1-44). Oxford, UK: Blackwell.

Hopkins, N. P., & Reicher, S. D. (2016). The psychology of health and well-being in mass gatherings: A review and an agenda for research. *Journal of Epidemiology and Global Health*, *6*, 49-57. doi: 10.1016/j.jegh.2015.06.001

Hopkins, N., Reicher, S. D., Khan, S. S., Tewari, S., Srinivasan, N., & Stevenson, C. (2015). Explaining effervescence: Investigating the relationship between shared social identity and positive experience in crowds. *Cognition & Emotion*, *30*, 20-32 doi:10.1080/02699931.2015.1015969

Hu, L., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55. http://dx.doi.org/10.1080/10705519909540118

Kenny, D. A., & McCoach, D. B. (2003). Effect of the number of variables on measures of fit in structural equation modelling. *Structural Equation Modeling, 10*, 333–351. http://dx.doi.org/10.1207/S15328007SEM1003_1

Khan, S. S., Hopkins, N., Tewari, S., Srinivasan, N., Reicher, S. D., & Ozakinci, G. (2014). Efficacy and well-being in rural north India: The role of social identification with a large-scale community identity. *European Journal of Social Psychology, 44*, 787-798. doi:10.1002/ejsp.2060

Khan, S. S., Hopkins, N., Reicher, S., Tewari, S., Srinivasan, N., & Stevenson, C. (2016). How collective participation impacts social identity: A longitudinal study from India. *Political Psychology, 37*, 309–325. doi: 10.1111/pops.12260

Klein, O., Spears, R., & Reicher, S. (2007). Social identity performance: Extending the strategic side of SIDE. *Personality and Social Psychology Review*, *11*, 28-45. doi: 10.1177/1088868306294588

Kline, R. (2005). *Principles and practices of structural equation modeling* (2nd ed.). New York, NY: The Guildford Press.

Leach, C. W., van Zomeren, M., Zebel, S., Vliek, M. L., Pennekamp, S. F., Doosje, B., ... & Spears, R. (2008). Group-level self-definition and self-investment: a hierarchical (multicomponent) model of in-group identification. *Journal of Personality and Social Psychology*, *95*, 144-165. DOI: 10.1037/0022-3514.95.1.144

Little, T. D., Lindenberger, U., & Nesselroade, J. R. (1999). On selecting indicators for multivariate measurement and modeling with latent variables: When" good" indicators are bad and" bad" indicators are good. *Psychological Methods*, *4*, 192-211. http://dx.doi.org/10.1037/1082-989X.4.2.192.

Low, M. (2007). *Empire of the Hajj: Pilgrims, plagues, and pan-Islam under British surveillance*. M.A. thesis, Georgia State University, Atlanta, GA.

Lynch, O. (2015). Suspicion, exclusion and othering since 9/11: The victimization of Muslim youth. In O. Lynch & J. Argomaniz (Eds.) (pp. 173-200) *International perspectives on terrorist victimization: An interdisciplinary approach*. London: Palgrave Macmillan

Maqsood, R. W. (2008). *Need to know: Islam*. London: Harper Collins.

Marsh, H. W., Hau, K. T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling*, *11*, 320-341. http://dx.doi.org/10.1207/s15328007sem1103_2

Memish, Z. A., Stephens, G. M., Steffen, R., & Ahmed, Q. A. (2012). Emergence of medicine for mass gatherings: Lessons from the Hajj. *The Lancet Infectious Diseases*, *12*, 56-65. doi: 10.1016/S1473-3099(11)70337-1.

Ministry of Economy and Planning, Central Department of Statistics and Information, Saudi Arabia (2014). The latest statistical information. www.cdsi.gov.sa/index.php

Ministry of Hajj (2013). *Deputy Ministry for Planning and Development, the General Directorate for Information Technology Hajj 1433*. Makkah, Kingdom of Saudi Arabia: Ministry of Hajj.

Muthén, L. K., & Muthén, B. O. (1998-2010). *Mplus user's guide*. Sixth Edition. Los Angeles, CA: Muthén & Muthén.

Neville F., & Reicher, S. (2011). The experience of collective participation: Shared identity, relatedness, and emotionality. *Contemporary Social Science, 6*, 377–396. doi.org/10.1080/21582041.2012.627277

Nigosian, S. A. (2004). *Islam: Its history, teaching, and practices*. Indiana: Indiana University Press.

Novelli, D., Drury, J., Reicher, S., & Stott, C. (2013). Crowdedness mediates the effect of social identification on positive emotion in a crowd: A survey of two crowd events. *PLoS ONE 8*(11): e78983. doi:10.1371/journal.pone.0078983

Oyserman, D. (2014). Identity-based motivation: Core processes and intervention examples. *Advances in Motivation and Achievement, 18*, 213-242, DOI: 10.1108/S0749-742320140000018006

Paluck, E. L., Green, S., & Green, D. P. (2017). The contact hypothesis revisited. *SSRN* doi.org/10.2139/ssrn.2973474

Pandey, K., Stevenson, C., Shankar, S., Hopkins, N. P., & Reicher, S. D. (2014), Cold comfort at the Magh Mela: Social identity processes and physical hardship. *British Journal of Social Psychology, 53*, 675–690. doi: 10.1111/bjso.12054

Páez, D., Rimé, B., Basabe, N., Wlodarczyk, A., & Zumeta, L. (2015). Psychosocial effects of perceived emotional synchrony in collective gatherings. *Journal of Personality and Social Psychology, 108*, 711-29. doi: 10.1037/pspi0000014

Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. *Journal of Personality and Social Psychology, 90,* 751-783. Doi: 10.1037/0022-3514.90.5.751

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology, 63*, 539-569. DOI: 10.1146/annurev-psych-120710-100452

Reicher, S. (2011). Mass action and mundane reality: An argument for putting crowd analysis at the centre of the social sciences. *Contemporary Social Science, 6,* 433-449. doi.org/10.1080/21582041.2011.619347

Reicher, S., & Drury, J. (2011). Collective identity, political participation and the making of the social self. In A. Azzi, X. Chryssochoou, B. Klandermans, & B. Simon (Eds.), *Identity and participation in culturally diverse societies: A multidisciplinary perspective* (pp. 158-176). Oxford, UK: Wiley-Blackwell.

Satorra, A., & Bentler, P. M. (1994). Corrections to test statistics and standard errors in covariance structure analysis. In A. von Eye & C. C. Clogg (Eds.), *Latent variables analysis: Applications for developmental research* (pp. 399-419). Thousand Oaks, CA: Sage.

Shankar, S., Stevenson, C., Pandey, K., Tewari, S., Hopkins, N. P., & Reicher, S. D. (2013). A calming cacophony: Social identity can shape the experience of loud noise. *Journal of Environmental Psychology, 36*, 87-95. doi:10.1016/j.jenvp.2013.07.004

Shariati, A. (2005). *Hajj: Reflection on its rituals*. Houston, TX: Islamic Publications International.

Sheldon, K. M. (2014). Becoming oneself: The central role of self-concordant goal selection. *Personality and Social Psychology Review*, *18*, 349-365. DOI: 10.1177/1088868314538549

Sim, F., & Mackie, P. (2015). The language of the masses. *Public Health, 129,* 1429-1430. doi.org/10.1016/j.puhe.2015.10.005

Singer, J. A., & Blagov, P. (2004). The integrative function of narrative processing: Autobiographical memory, self-defining memories, and the life story of identity. In D. R. Beike, J. M. Lampinen, & D. A. Behrend (Eds.), *Studies in self and identity. The self and memory* (pp. 117-138). New York, NY: Psychology Press.

Sirgy, M. J. (1986). *Self-congruity: Toward a theory of personality and cybernetics*. New York, NY: Praeger.

Slight, J. (2016). British colonial knowledge and the Hajj in the age of empire. In U. Ryad (Ed.), *Europe and the Hajj in the age of empire* (pp. 81-111) Leiden, NL: Brill.

Smith, P. B., Vignoles, V. L., Becker, M., Owe, E., Easterbrook, M. J., Brown, R., ... & Yuki, M. (2016). Individual and culture-level components of survey response styles: A multi-level analysis using cultural models of selfhood. *International Journal of Psychology, 51*, 453-463. DOI: 10.1002/ijop.12293

Steiger, J. H. (2002). When constraints interact: A caution about reference variables, identification constraints, and scale dependencies in structural equation modeling. *Psychological Methods, 7*, 210 -227. http://dx.doi.org/10.1037/1082-989X.7.2.210.

Swann, W. B., Jr., & Bosson, J. K. (2008). Identity negotiation: A theory of self and social interaction. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 448-471). New York, NY: Guilford Press.

Swann, W. B., Jr., & Buhrmester, M. D. (2012). Self-verification: The search for coherence. In M. R. Leary, & J. P. Tangney (Eds.), *Handbook of self and identity* (2nd ed., pp. 405-424). New York, NY: Guilford Press.

Tausch, N., & Hewstone, M. (2010). Intergroup contact. In J. F. Dovidio, M. Hewstone, M., P. Glick, & V. Essess (Eds.), *Handbook of prejudice, stereotyping, and discrimination* (pp. 544-560). Los Angeles, CA: Sage,

Tausch, N., Hewstone, M., Kenworthy, J. B., Psaltis, C., Schmid, K., Popan, J., Cairns, E., & Hughes, J. (2010). Secondary transfer effects of intergroup contact: Alternative accounts and underlying processes. *Journal of Personality and Social Psychology, 99,* 282-302. DOI: 10.1037/a0018553

Tewari, S., Khan, S., Hopkins, N., Srinivasan, N., & Reicher, S. (2012). Participation in mass gatherings can benefit well-being: longitudinal and control data from a north Indian Hindu pilgrimage event. *PLoS ONE, 7*(10), e47291. doi:10.1371/journal.pone.0047291

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. Oxford, UK: Blackwell.

Van Zomeren, M., Leach, C. W., & Spears, R. (2012). Protesters as "passionate economists" a dynamic dual pathway model of approach coping with collective disadvantage. *Personality and Social Psychology Review, 16*, 180-199. DOI: 10.1177/1088868311430835

Vignoles, V. L. (2011). Identity motives. In S. J. Schwartz, K. Luyckx, and V. L. Vignoles (Eds.), *Handbook of identity theory and research. Volume 1: Structures and processes* (pp. 403-432). New York, NY: Springer.

Vignoles, V. L. (2019). Identity: Personal AND social. In K. Deaux & M. Snyder (Eds.), *Oxford handbook of personality and social psychology* (2nd ed., pp. 289-315). New York: Oxford University Press.

Welkenhuysen-Gybels, J., Billiet, J., & Cambré, B. (2003). Adjustment for acquiescence in the assessment of the construct equivalence of Likert-type score items. *Journal of Cross-Cultural Psychology*, *34*, 702–722. doi.org/10.1177/0022022103257070

Whitehouse, H., & Lanman, J. A. (2014). The ties that bind us: Ritual, fusion, and identification. *Current Anthropology, 55*, 674-695. DOI: 10.1086/678698

X, Malcolm (1965). *The autobiography of Malcolm X* (with Alex Haley). New York: Grove Press.

Xygalatas, D., Mitkidis, P., Fischer, R., Reddish, P., Skewes, J., Geertz, A. W., ... & Bulbulia, J. (2013). Extreme rituals promote prosociality. *Psychological Science*, *24*, 1602–1605. DOI: 10.1177/0956797612472910

Figure titles and notes

Figure 1. Schematic of theoretical model tested

Figure 2. Summary of significant paths from our structural equation model

Note: Values reported are standardized parameter estimates. Indicators, error variances, control variables, and non-significant paths were included in the model, but they are omitted from the figure to improve clarity.

Endnotes

[1] Known in Arabic as Makkah.

[2] The *Magh Mela* pilgrimage takes place every year at the confluence of the Ganges and Yamuna rivers. Larger versions of the festival take place every six (*Ardh Kumbh Mela*) and 12 (the *Maha Kumbh Mela*) years. On each occasion, millions gather for rituals centred on bathing in the river.

[3] The Hajj rituals last for five days, but pilgrims also gather at the Grand Mosque to take part in *tawaf* in the days beforehand and immediately afterwards.

[4] The questionnaire was mistakenly formatted "18-20, 20-30, 30-40, 40-50, 50 and over". We have therefore re-presented these data, though it is likely that there is some minor error in the figures in each age category.

[5] Other than demographic and other non-psychological/behavioural information, there were 72 items in the questionnaire. They were blocked together as follows: 10 items on positive and negative experience in the crowd; 2 items on perceived unity in the crowd; 3 items on crowdedness; 2 items on perceptions of specific locations; 6 items on Muslim identity; 5 items on shared identity with the crowd; 6 items on social support / cooperation (both given and perceived); 6 items on peaceful and conflictual behaviour in the crowd; 5 items on safety; 6 items on emergencies; 15 items on perceptions of Saudi staff; and 6 items on experienced self-changes. Previous studies have employed a different subset of these items to examine two separate questions. Alnabulsi and Drury (2014) examined predictors of feeling safe (which included including researchers' estimates of crowd density; perceptions of management competence; identification with the crowd; and perceptions of support). Alnabulsi, Drury, and Templeton (2018) examined effects of location in the Mosque on the extent to which pilgrims gave others support.

[6] Clingingsmith et al.'s (2009) items named specific countries; however, their sample consisted only of Pakistani Hajjis, and so therefore it was possible to identify a small number of relevant outgroups; since our own sample took in multiple nationalities, it was not feasible to name all possible relevant national outgroups.

[7] Additionally, we checked the reliabilities of all measures separately among subgroups of participants who had responded in each of the seven languages of the study. Reliabilities were largely acceptable for six of the seven languages. However, several measures had especially poor reliabilities among French-speaking participants. We conducted a parallel set of analyses excluding French-speaking participants (around 10% of the total sample). These parallel analyses showed a substantively identical pattern of findings to our main analyses.

[8] Our model showed a small negative path from perception of a peaceful crowd to giving support. Although this effect was not predicted, we can speculate that those who experienced the crowd as less peaceful may have been more likely to perceive other crowd members as needing help—and therefore they would have been more likely to have given support.

[9] As shown in Tables 3 and 4, our model also revealed some demographic trends: Older participants were more likely than younger participants to report *increased positive outgroup attitudes* ($p < .01$). Those who had previously attended the Hajj reported higher identification with the crowd ($p < .05$). More educated participants, those who had previously attended the Hajj, and those who were attending alone were more likely to report *giving support* to others (all $p < .01$). Additionally, those who had previously attended the Hajj reported higher *perceived cooperation* and *positive experiences* in the crowd (both $p < .05$), and those who were attending alone reported higher *positive experiences* ($p < .01$). We found no significant gender differences in any of our main variables (all $p > .05$); however, female participants were likely to have lower education ($p < 001$), more likely to be attending for the first time ($p < .01$), and less likely to have been sampled during, compared to after, the main ritual ($p < .05$).

[10] *Ummah* is the term used to refer to the world-wide Muslim community.

[11] We did not test for indirect effects of demographic control variables in our main analyses, but a post-hoc analysis revealed two significant indirect pathways: For *first attendance* → *identification with crowd* → *enhanced Muslim identification*, *SPE* = -.032, *SE* = .014, $p = .024$, 95% CI: -.059, -.004. For *first attendance* → *identification with crowd* → *increased positive outgroup attitudes*, *SPE* = -.034, *SE* = .017, $p = .045$, 95% CI: -.068, -.001.